WHAT IS CLAIMED IS:

Sub Q1

1. A method for coding video frames in a video compression system having coding mode biases, including automatically scaling the coding mode biases as a function of the number of bits of coding precision used to code video frames in the video compression system.

2. A method for coding video frames in a video compression system having coding mode biases, including automatically scaling the coding mode biases as a function of at least one of the dynamic range and contrast range of at least one image unit of such video frames.

3. A method for coding video frames in a video compression system having coding mode biases, including automatically scaling the coding mode biases as a function of a quantization parameter associated with the video frames.

4. A method for coding video frames in a video compression system having coding mode biases, including selecting coding mode biases as a function of the total number of bits required for macroblock coding of at least one region within a frame.

5. A method for coding video images in a video compression system having coding mode biases, including setting all biases to zero.

6. A method for coding video frames in a video compression system, including:

(a) selecting a plurality of coding modes;

(b) applying each coding mode to at least a macroblock within at least one video frame;

(c) determining the number of coded bits for each such coding mode; and

(d) selecting, as a preferred coding mode, one of the plurality of coding modes resulting in no more than a selected number of coded bits for the at least one video frame.

7. The method of claim 6, further including:

(a) determining a measure of image quality for each such coding mode; and

(b) selecting, as a preferred coding mode, one of the plurality of coding modes having a selected combination of number of coded bits and image quality for the at least one video frame.

8. A method for coding video frames in a video compression system, including:

(a) selecting a plurality of coding modes;

(b) applying each coding mode to at least one macroblock within at least one video frame;

(c) determining a measure of image quality for each such coding mode; and

(d) selecting, as a preferred coding mode, one of the plurality of coding modes having at least a selected image quality for the at least one video frame.

9. The method of claim 8, further including:

(a) determining the number of coded bits for each such coding mode; and

(b) selecting, as a preferred coding mode, one of the plurality of coding modes having a selected combination of number of coded bits and image quality for the at least one video frame.

10. The method of claim 8, wherein the measure of image quality is a function of a power spectrum of the difference between an original video frame compared to a coded and decoded video frame.

11. The method of claim 8, wherein the measure of image quality is the signal to noise ratio of an original video frame compared to a coded and decoded video frame.

12. The method of claim 11, wherein the signal to noise ratio (SNR) is a luminance SNR.

13. The method of claim 11, wherein the signal to noise ratio (SNR) is a chroma SNR.

14. The method of claim 11, wherein the signal to noise ratio (SNR) is a red-green-blue color space SNR.

15. A method for coding of macroblocks of video frames in a video compression system, including:

(a) determining an AC motion vector corresponding to an AC match of macroblocks of at least two frames, wherein the AC match meets a first selected quality criteria;

(b) determining a DC motion vector corresponding to a DC match of macroblocks of at least two frames, wherein the DC match meets a second selected quality criteria;

(c) selecting a plurality of coding modes;

(d) applying each coding mode to at least one macroblock within at least one video frame using each of the AC and DC motion vectors to create a set of candidate image codings;

(e) determining a measure of image quality for each candidate image coding;

(f) selecting, as a preferred coding mode, one of the plurality of coding modes having a selected combination of number of coded bits and image quality for the at least one video frame; and

(g) selecting, as an overall motion vector, the AC or DC motion vector corresponding to the preferred coding mode.

16. The method of claim 15, wherein the video frames are non-bi-directionally predicted frames.

17. The method of claim 16, further including:

(a) determining the number of coded bits and image quality for at least one bi-directionally predicted frame with respect to one or more preceding or succeeding non-bi-directionally predicted frames; and

(b) selecting a preferred coding mode and overall motion vector as a function of such determined number of coded bits and image quality.

18. A method for coding video frames in a video compression system, including:

(a) selecting a plurality of frame coding choices;

(b) applying each frame coding choice to at least one macroblock within at least one video frame;

(c) determining a measure of image quality for each such frame coding choice;

(d) determining the number of coded bits for each such frame coding choice; and

(e) selecting, as a preferred frame coding choice, one of the plurality of frame coding choices having a selected combination of number of coded bits and image quality for the at least one video frame.

19. The method of claim 18, wherein the frame coding choices include two or more of forward, backward, interpolative, and direct modes.

20. The method of claim 18, wherein the frame coding choices include inter macroblock and intra macroblock coding.

21. A method for coding video frames in a video compression system, including:

(a) selecting a plurality of frame coding choices;

(b) applying each frame coding choice to at least one macroblock within at least one video frame;

(c) determining a measure of image quality for each such frame coding choice;

(d) determining the number of coded bits, for a set of selected quantization parameter (QP) values or quantization frequency weighting matrices, for each such frame coding choice; and

(e) selecting, as a preferred frame coding choice, one of the plurality of frame coding choices having a selected combination of number of coded bits and image quality for the at least one video frame.

22. The method of claim 21, wherein the video frames are non-bi-directionally predicted frames.

23. The method of claim 22, further including:

(a) determining the number of coded bits and image quality for at least one bi-directionally predicted frame with respect to one or more preceding or succeeding non-bi-directionally predicted frames; and

(b) selecting a preferred frame coding choice as a function of such determined number of coded bits and image quality.

24. A method for coding video frames in a video compression system, including:

(a) selecting a plurality of frame coding choices;

(b) applying each frame coding choice to at least one macroblock within at least one video frame;

(c) determining a measure of image quality for each such frame coding choice;

(d) determining the number of coded bits, for a set of selected quantization parameter (QP) values or quantization frequency weighting matrices, for each such frame coding choice; and

(e) selecting, as a preferred QP value or quantization frequency weighting matrix, one of the set of selected quantization parameter (QP) values or quantization frequency weighting matrices having a selected combination of number of coded bits and image quality for the at least one video frame.

25. The method of claim 24, wherein the video frames are non-bi-directionally predicted frames.

26. The method of claim 25, further including:

(a) determining the number of coded bits and image quality for at least one bi-directionally predicted frame with respect to one or more preceding or succeeding non-bi-directionally predicted frames; and

(b) selecting a QP value or quantization frequency weighting matrix as a function of such determined number of coded bits and image quality.

27. A computer program, stored on a computer-readable medium, for coding video frames in a video compression system having coding mode biases, the computer program comprising instructions for causing a computer to automatically scale the coding mode biases as a function of the number of bits of coding precision used to code video frames in the video compression system.

28. A computer program, stored on a computer-readable medium, for coding video frames in a video compression system having coding mode biases, the computer program comprising instructions for causing a computer to automatically scale the coding mode biases as a function of at least one of the dynamic range and contrast range of at least one image unit of such video frames.

29. A computer program, stored on a computer-readable medium, for coding video frames in a video compression system having coding mode biases, the computer program comprising instructions for causing a computer to

automatically scale the coding mode biases as a function of a quantization parameter associated with the video frames.

30. A computer program, stored on a computer-readable medium, for coding video frames in a video compression system having coding mode biases, the computer program comprising instructions for causing a computer to select coding mode biases as a function of the total number of bits required for macroblock coding of at least one region within a frame.

31. A computer program, stored on a computer-readable medium, for coding video images in a video compression system having coding mode biases, the computer program comprising instructions for causing a computer to set all biases to zero.

32. A computer program, stored on a computer-readable medium, for coding video frames in a video compression system, the computer program comprising instructions for causing a computer to:

(a) select a plurality of coding modes;

(b) apply each coding mode to at least a macroblock within at least one video frame;

(c) determine the number of coded bits for each such coding mode; and

(d) select, as a preferred coding mode, one of the plurality of coding modes resulting in no more than a selected number of coded bits for the at least one video frame.

33. The computer program of claim 32, further including instructions for causing a computer to:

(a) determine a measure of image quality for each such coding mode; and

(b) select, as a preferred coding mode, one of the plurality of coding modes having a selected combination of number of coded bits and image quality for the at least one video frame.

34. A computer program, stored on a computer-readable medium, for coding video frames in a video compression system, the computer program comprising instructions for causing a computer to:

(a) select a plurality of coding modes;

(b) apply each coding mode to at least one macroblock within at least one video frame;

(c) determine a measure of image quality for each such coding mode; and

(d) select, as a preferred coding mode, one of the plurality of coding modes having at least a selected image quality for the at least one video frame.

35. The computer program of claim 34, further including instructions for causing a computer to:

(a) determine the number of coded bits for each such coding mode; and

(b) select, as a preferred coding mode, one of the plurality of coding modes having a selected combination of number of coded bits and image quality for the at least one video frame.

36. The computer program of claim 34, wherein the measure of image quality is a function of a power spectrum

of the difference between an original video frame compared to a coded and decoded video frame.

37. The computer program of claim 34, wherein the measure of image quality is the signal to noise ratio of an original video frame compared to a coded and decoded video frame.

38. The computer program of claim 37, wherein the signal to noise ratio (SNR) is a luminance SNR.

39. The computer program of claim 37, wherein the signal to noise ratio (SNR) is a chroma SNR.

40. The computer program of claim 37, wherein the signal to noise ratio (SNR) is a red-green-blue color space SNR.

41. A computer program, stored on a computer-readable medium, for coding of macroblocks of video frames in a video compression system, the computer program comprising instructions for causing a computer to:

(a) determine an AC motion vector corresponding to an AC match of macroblocks of at least two frames, wherein the AC match meets a first selected quality criteria;

(b) determine a DC motion vector corresponding to a DC match of macroblocks of at least two frames, wherein the DC match meets a second selected quality criteria;

(c) select a plurality of coding modes;

(d) apply each coding mode to at least one macroblock within at least one video frame using each

of the AC and DC motion vectors to create a set of candidate image codings;

(e) determine a measure of image quality for each candidate image coding;

(f) select, as a preferred coding mode, one of the plurality of coding modes having a selected combination of number of coded bits and image quality for the at least one video frame; and

(g) select, as an overall motion vector, the AC or DC motion vector corresponding to the preferred coding mode.

42. The computer program of claim 41, wherein the video frames are non-bi-directionally predicted frames.

43. The computer program of claim 42, further including instructions for causing a computer to:

(a) determine the number of coded bits and image quality for at least one bi-directionally predicted frame with respect to one or more preceding or succeeding non-bi-directionally predicted frames; and

(b) select a preferred coding mode and overall motion vector as a function of such determined number of coded bits and image quality.

44. A computer program, stored on a computer-readable medium, for coding video frames in a video compression system, the computer program comprising instructions for causing a computer to:

(a) select a plurality of frame coding choices;

(b) apply each frame coding choice to at least one macroblock within at least one video frame;

(c) determine a measure of image quality for each such frame coding choice;

(d) determine the number of coded bits for each such frame coding choice; and

(e) select, as a preferred frame coding choice, one of the plurality of frame coding choices having a selected combination of number of coded bits and image quality for the at least one video frame.

45. The computer program of claim 44, wherein the frame coding choices include two or more of forward, backward, interpolative, and direct modes.

46. The computer program of claim 44, wherein the frame coding choices include inter macroblock and intra macroblock coding.

47. A computer program, stored on a computer-readable medium, for coding video frames in a video compression system, the computer program comprising instructions for causing a computer to:

(a) select a plurality of frame coding choices;

(b) apply each frame coding choice to at least one macroblock within at least one video frame;

(c) determine a measure of image quality for each such frame coding choice;

(d) determine the number of coded bits, for a set of selected quantization parameter (QP) values or quantization frequency weighting matrices, for each such frame coding choice; and

(e) select, as a preferred frame coding choice, one of the plurality of frame coding choices having a

selected combination of number of coded bits and image quality for the at least one video frame.

48. The computer program of claim 47, wherein the video frames are non-bi-directionally predicted frames.

49. The computer program of claim 48, further including instructions for causing a computer to:

(a) determine the number of coded bits and image quality for at least one bi-directionally predicted frame with respect to one or more preceding or succeeding non-bi-directionally predicted frames; and

(b) select a preferred frame coding choice as a function of such determined number of coded bits and image quality.

50. A computer program, stored on a computer-readable medium, for coding video frames in a video compression system, the computer program comprising instructions for causing a computer to:

(a) select a plurality of frame coding choices;

(b) apply each frame coding choice to at least one macroblock within at least one video frame;

(c) determine a measure of image quality for each such frame coding choice;

(d) determine the number of coded bits, for a set of selected quantization parameter (QP) values or quantization frequency weighting matrices, for each such frame coding choice; and

(e) select, as a preferred QP value or quantization frequency weighting matrix, one of the set of selected quantization parameter (QP) values or quantization frequency weighting matrices having a

selected combination of number of coded bits and image quality for the at least one video frame.

51. The computer program of claim 50, wherein the video frames are non-bi-directionally predicted frames.

52. The computer program of claim 51, further including:

(a) determine the number of coded bits and image quality for at least one bi-directionally predicted frame with respect to one or more preceding or succeeding non-bi-directionally predicted frames; and

(b) select a QP value or quantization frequency weighting matrix as a function of such determined number of coded bits and image quality.

53. A system for coding video frames in a video compression system having coding mode biases, including:

(a) means for inputting one or more video frames to be compressed; and

(b) means for automatically scaling the coding mode biases for such video frames as a function of the number of bits of coding precision used to code such video frames.

54. A system for coding video frames in a video compression system having coding mode biases, including:

(a) means for inputting one or more video frames to be compressed; and

(b) means for automatically scaling the coding mode biases for such video frames as a function of at least one of the dynamic range and contrast range of at least one image unit of such video frames.

55. A system for coding video frames in a video compression system having coding mode biases, including:

(a) means for inputting one or more video frames to be compressed; and

(b) means for automatically scaling the coding mode biases for such video frames as a function of a quantization parameter associated with at least one video frame.

56. A system for coding video frames in a video compression system having coding mode biases, including:

(a) means for inputting one or more video frames to be compressed; and

(b) means for selecting coding mode biases for such video frames as a function of the total number of bits required for macroblock coding of at least one image unit of such video frames.

57. A system for coding video images in a video compression system having coding mode biases, including:

(a) means for inputting one or more video frames to be compressed; and

(b) means for setting all biases for such video frames to zero.

58. A system for coding video frames in a video compression system, including:

(a) means for selecting a plurality of coding modes;

(b) means for applying each coding mode to at least a macroblock within at least one video frame;

(c) means for determining the number of coded bits for each such coding mode; and

(d) means for selecting, as a preferred coding mode, one of the plurality of coding modes resulting in no more than a selected number of coded bits for the at least one video frame.

59. The system of claim 58, further including:

(a) means for determining a measure of image quality for each such coding mode; and

(b) means for selecting, as a preferred coding mode, one of the plurality of coding modes having a selected combination of number of coded bits and image quality for the at least one video frame.

60. A system for coding video frames in a video compression system, including:

(a) means for selecting a plurality of coding modes;

(b) means for applying each coding mode to at least one macroblock within at least one video frame;

(c) means for determining a measure of image quality for each such coding mode; and

(d) means for selecting, as a preferred coding mode, one of the plurality of coding modes having at least a selected image quality for the at least one video frame.

61. The system of claim 60, further including:

(a) means for determining the number of coded bits for each such coding mode; and

(b) means for selecting, as a preferred coding mode, one of the plurality of coding modes having a

selected combination of number of coded bits and image quality for the at least one video frame.

62. The system of claim 60, wherein the measure of image quality is a function of a power spectrum of the difference between an original video frame compared to a coded and decoded video frame.

63. The system of claim 60, wherein the measure of image quality is the signal to noise ratio of an original video frame compared to a coded and decoded video frame.

64. The system of claim 63, wherein the signal to noise ratio (SNR) is a luminance SNR.

65. The system of claim 63, wherein the signal to noise ratio (SNR) is a chroma SNR.

66. The system of claim 63, wherein the signal to noise ratio (SNR) is a red-green-blue color space SNR.

67. A system for coding of macroblocks of video frames in a video compression system, including:

(a) means for determining an AC motion vector corresponding to an AC match of macroblocks of at least two frames, wherein the AC match meets a first selected quality criteria;

(b) means for determining a DC motion vector corresponding to a DC match of macroblocks of at least two frames, wherein the DC match meets a second selected quality criteria;

(c) means for selecting a plurality of coding modes;

(d) means for applying each coding mode to at least one macroblock within at least one video frame using each of the AC and DC motion vectors to create a set of candidate image codings;

(e) means for determining a measure of image quality for each candidate image coding;

(f) means for selecting, as a preferred coding mode, one of the plurality of coding modes having a selected combination of number of coded bits and image quality for the at least one video frame; and

(g) means for selecting, as an overall motion vector, the AC or DC motion vector corresponding to the preferred coding mode.

68. The system of claim 67, wherein the video frames are non-bi-directionally predicted frames.

69. The system of claim 68, further including:

(a) means for determining the number of coded bits and image quality for at least one bi-directionally predicted frame with respect to one or more preceding or succeeding non-bi-directionally predicted frames; and

(b) means for selecting a preferred coding mode and overall motion vector as a function of such determined number of coded bits and image quality.

70. A system for coding video frames in a video compression system, including:

(a) means for selecting a plurality of frame coding choices;

(b) means for applying each frame coding choice to at least one macroblock within at least one video frame;

(c) means for determining a measure of image quality for each such frame coding choice;

(d) means for determining the number of coded bits for each such frame coding choice; and

(e) means for selecting, as a preferred frame coding choice, one of the plurality of frame coding choices having a selected combination of number of coded bits and image quality for the at least one video frame.

71. The system of claim 70, wherein the frame coding choices include two or more of forward, backward, interpolative, and direct modes.

72. The system of claim 70, wherein the frame coding choices include inter macroblock and intra macroblock coding.

73. A system for coding video frames in a video compression system, including:

(a) means for selecting a plurality of frame coding choices;

(b) means for applying each frame coding choice to at least one macroblock within at least one video frame;

(c) means for determining a measure of image quality for each such frame coding choice;

(d) means for determining the number of coded bits, for a set of selected quantization parameter

(QP) values or quantization frequency weighting matrices, for each such frame coding choice; and

(e) means for selecting, as a preferred frame coding choice, one of the plurality of frame coding choices having a selected combination of number of coded bits and image quality for the at least one video frame.

74. The system of claim 73, wherein the video frames are non-bi-directionally predicted frames.

75. The system of claim 74, further including:

(a) means for determining the number of coded bits and image quality for at least one bi-directionally predicted frame with respect to one or more preceding or succeeding non-bi-directionally predicted frames; and

(b) means for selecting a preferred frame coding choice as a function of such determined number of coded bits and image quality.

76. A system for coding video frames in a video compression system, including:

(a) means for selecting a plurality of frame coding choices;

(b) means for applying each frame coding choice to at least one macroblock within at least one video frame;

(c) means for determining a measure of image quality for each such frame coding choice;

(d) means for determining the number of coded bits, for a set of selected quantization parameter

(QP) values or quantization frequency weighting matrices, for each such frame coding choice; and

(e) means for selecting, as a preferred QP value or quantization frequency weighting matrix, one of the set of selected quantization parameter (QP) values or quantization frequency weighting matrices having a selected combination of number of coded bits and image quality for the at least one video frame.

77. The system of claim 76, wherein the video frames are non-bi-directionally predicted frames.

78. The system of claim 77, further including:

(a) means for determining the number of coded bits and image quality for at least one bi-directionally predicted frame with respect to one or more preceding or succeeding non-bi-directionally predicted frames; and

(b) means for selecting a QP value or quantization frequency weighting matrix as a function of such determined number of coded bits and image quality.